

**REMARKS****I. General**

Claims 1-23 are pending in the present application. Applicant notes with appreciation that the Examiner has indicated that claims 7-9 include allowable subject matter and would be allowed if rewritten in independent form. Claims 1-6, 11, and 13-15 stand rejected under 35 U.S.C. § 102. Claims 12 and 19 stand rejected under 35 U.S.C. § 103. Claims 12 and 20-23 stand rejected under 35 U.S.C. § 112. Claims 1-14 and 16 and the specification stand objected to because of informalities. Applicant respectfully traverses the rejections and objections of record.

Dependent claims 7 and 8 have been amended to include the limitations of base claim 1 and intervening claim 5 from which they depend. Accordingly, claims 7 and 8 have been amended to present the original limitations thereof in independent form. The Examiner has conceded that claims 7 and 8 include patentable subject matter. Accordingly, claims 7 and 8, as well as claim 9 dependent from claim 8, are asserted to be in immediate condition for allowance.

**II. The Objections to the Specification**

The specification stands objected to because of an informality wherein “3-1=2” appeared at page 8, line 2, rather than “4-1=3”. Applicant has submitted herewith a replacement paragraph correcting the foregoing. Accordingly, the objection to the specification should be withdrawn.

**III. The Claim Objections**

Claims 1-14 and 16 stand objected to because of informalities. Specifically, claims 1 and 4 stand objected to because the phrase “said set” should be “said set of differentiators”. Claim 12 stands objected to because recital of “invention” should be “modulator”. Claim 16 stands objected to because “a revised input” should be “an intermediate input signal” and “said integrated input signal” should be “said integrated input signal”. Applicant has amended claims 1, 4, 12, and 16 as suggested by the Examiner. Accordingly, the objections to claims 1-14 and 16 should be withdrawn.

**IV. The 35 U.S.C. § 112 Rejections**

Claims 20-23 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. Claim 12 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicant respectfully traverses the 35 U.S.C. § 112 rejections of record.

In rejecting claim 20 under 35 U.S.C. § 112, first paragraph, the Examiner states that “[t]he configuration of claim 20 does not correspond to the disclosure of the drawings,” see the Office Action at page 4. However, this is not the standard for enablement under 35 U.S.C. § 112, first paragraph, because any part of the disclosure (including the specification, drawing, and claims) may be relied upon for enablement, see M.P.E.P. § 2164. Accordingly, Applicant respectfully asserts that whether or not the claim corresponds to the disclosure of the drawings is immaterial to the claim being patentable under 35 U.S.C. § 112, first paragraph.

Moreover, the portion of claim 20 identified by the Examiner as not corresponding to the drawings is clearly present in Figure 8. The rejection of record asserts that the “means for providing said modulated output signal to an output of said multi-order delta-sigma modulator” is not shown because “no additional circuitry is shown other than the summing circuit 600 of Figure 8 for providing said modulated output signal to an output of said multi-order delta-sigma modulator,” the Office Action at pages 4-5. However, the foregoing is not accurate. Figure 8 clearly shows summing circuit 600 coupled to a length of signal path external thereto. It is Applicant’s position that this length of signal path provides support in the drawings for the recited “means for providing said modulated output signal to an output of said multi-order delta-sigma modulator.” As the Examiner has not provided a reasonable basis to question that this length of signal path would not enable one of ordinary skill in the art to “provide said modulated output signal to an output of said multi-order delta-sigma modulator,” as required by M.P.E.P. § 2164.04, Applicant respectfully asserts that the 35 U.S.C. § 112, first paragraph, rejection of record is improper.

In an effort to expedite issuance of the foregoing claims, Applicant has amended claim 20 to delete the limitation “means for providing said modulated output signal to an

output of said multi-order delta-sigma modulator,” thereby broadening the claim. Applicant respectfully asserts that the 35 U.S.C. § 112, first paragraph, rejection of claims 20-23 is now moot. As such, applicant respectfully asserts that claims 20-23 should stand allowed.

In rejecting claim 12 under 35 U.S.C. § 112, second paragraph, the Examiner states that the phrase “said input signal” at lines 2-3 thereof lacks clear antecedent basis. Claim 12 has been amended to recite “an input signal.” It is respectfully asserted that claim 12 is patentable under 35 U.S.C. § 112, second paragraph.

#### V. The 35 U.S.C. § 102 Rejections

Claims 1-6, 11, and 13-15 stand rejected under 35 U.S.C. § 102(a) as being anticipated by prior art Figure 5 of the present application. However, to anticipate a claim under 35 U.S.C. § 102, a reference must teach every element of the claim, see M.P.E.P. § 2131. Moreover, in order for a prior art reference to be anticipatory under 35 U.S.C. § 102 with respect to a claim, “[t]he elements must be arranged as required by the claim,” see M.P.E.P. § 2131, citing *In re Bond*, 15 US.P.Q.2d 1566 (Fed. Cir. 1990). Applicant respectfully asserts that the prior art represented by Figure 5 does not teach every element of the claims and does not teach elements arranged as required by the claims.

Claim 1 recites that the reference signal of the subsequent delta-sigma modulator stages are variable in relation to the reference signal of the first delta-sigma modulator stage. The rejection of record relies upon the output of quantizer 51 in delta-sigma modulator stage 510 as the first reference signal and the output of the quantizer 51 in each subsequent delta-sigma modulator stage as the reference signals thereof, see the Office Action at page 6. The output of quantizers 51, however, do not meet the recited reference signals.

The pending claims are to be given their broadest reasonable interpretation consistent with the specification, see M.P.E.P. § 2111 (citing *In re Hyatt*, 54 U.S.P.Q.2d 1664, 1667 (Fed. Cir. 2000)). Moreover, the words of a claim must be given their plain meaning unless Applicant has provided a clear definition in the specification, see M.P.E.P. § 2111.01 (citing *In re Zletz*, 13 U.S.P.Q.2d 1320, 1322 (Fed. Cir. 1989)). The plain and ordinary meaning of the adjective “reference” is commonly accepted as “used or usable for reference; esp: constituting a standard for measuring or constructing,” see Webster’s Ninth New Collegiate

Dictionary at page 989 (1988), a copy of which is attached hereto for the Examiner's convenience. In accordance with the foregoing, the present specification describes delta-sigma modulator stages which quantize an input signal using a reference signal to provide an output signal of that stage, see page 17, lines 11-14.

The output of quantizers 51 are not taught or suggested to provide a reference signal as recited in the claim. Moreover, claim 1 expressly recites "an output of each of said at least one subsequent stage." However, the Examiner is relying upon the output of these stages to meet the recited reference signal. As such, no element which has not already been relied upon to meet an aspect of the claims remains in the prior art of Figure 5 to meet the output of each of the subsequent stages recited in claim 1. Accordingly, Applicant respectfully asserts that claim 1 and the claims dependent therefrom are patentable under 35 U.S.C. § 102 over the prior art of Figure 5.

In an effort to expedite issuance of the foregoing claims, Applicant has amended claim 1 to expressly recite that the reference signal is a quantizer input reference signal, as shown *inter alia* in Figures 6, 7, 8 and 12. Correspondingly, claim 6 has been amended to track the language of claim 1. The claim amendments make the foregoing distinctions between a reference signal and the output of quantizers 51 inarguably clear. Claim 1 and the claims dependent therefrom are asserted to be patentable under 35 U.S.C. § 102 over the prior art of Figure 5.

Claim 15 recites "producing a first modulated signal from an input signal in a first delta-sigma modulator stage using a first reference" and "producing subsequent modulated signals in subsequent delta-sigma modulator stages using subsequent references . . ." As with claim 1 discussed above, the rejection of record relies upon the output of quantizer 51 in delta-sigma modulator stage 510 as the first reference signal and the output of the quantizer 51 in each subsequent delta-sigma modulator stage as the reference signals thereof, see the Office Action at page 6. The output of quantizers 51, however, do not meet the recited reference signals. The output of quantizers 51 cannot fairly be read to use the outputs thereof to produce a modulated signal from an input signal of a delta-sigma modulator stage. Accordingly, claim 15 and the claims dependent therefrom are asserted to be patentable under 35 U.S.C. § 102 over the prior art of Figure 5.

**VI. The 35 U.S.C. § 103 Rejections**

Claims 12 and 19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the prior art of Figure 5 in view of Melanson, United States patent number 6,373,417 (hereinafter *Melanson*). Claims 16-19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the prior art of Figure 5 in view of Shieu, United States patent number 5,191,332 (hereinafter *Shieu*). However, in order to establish a *prima facie* case of obviousness under 35 U.S.C. § 103, *inter alia*, the prior art reference (or references when combined) must teach or suggest all the claim limitations, see M.P.E.P. § 2143. Applicant has shown above that the prior art of Figure 5 does not meet the limitations of base claims 1 and 15. Moreover, the rejections of record do no rely upon the disclosures of *Melanson* or *Shieu* to cure the identified deficiencies. Accordingly, Applicant respectfully asserts that a *prima facie* case of obviousness under 35 U.S.C. § 103 has not been made of record with respect to claims 12 and 16-19.

**VII. Summary**

In view of the above, Applicant believes the pending application is in condition for allowance.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 06-2380, under Order No. 49581/P023US/09906909 from which the undersigned is authorized to draw.

Dated: January 18, 2005

Respectfully submitted,

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tion of some constituent quality or feature (a neighborhood that  
poverty) 3 : EMANATE ~ vi 1 : to subject to the action of  
vapor 2 : to give off : EXUDE (a politician who ~s charm)  
(a) ~ reeky 'rē-kē adj

(b) [ME, fr. OE hreōl: akin to ON *hraell* weaver's reed, Gk.  
to weave] (bef. 12c) 1 : a revolvable device on which some-  
thing is wound: as a : a small windlass at the butt of a fishing  
line\* b chiefly Brit : a spool or bobbin for sewing thread c  
spool for photographic film; esp : one for motion pictures  
entity of something wound on a reel 3 : a frame for drying  
linen having radial arms on a vertical pole  
4c) 1 : to wind on or as if on a reel 2 : to draw by reeling a  
fish in ~ vi : to turn a reel — reel·able 'rē-lə-bal adj  
ME relen, prob. fr. rel. n. w] vi (14c) 1 a : to turn or move  
round b : to be in a whirl 2 : to behave in a violent disor-  
der 3 : to waver or fall back (as from a blow) 4 : to walk  
insteadly ~ vi : to cause to reel  
72: a reeling motion  
fr. fr. *reel* (1585) 1: a lively Scottish-Highland dance; also  
ic for this dance 2: VIRGINIA REEL  
ē-lek'tēt vt (1601) : to elect for another term in office — re-  
fek-shən \n  
lar \n (ca. 1598) 1 : one that reels 2 : a motion picture  
specified number of reels (a two-reeler)  
1952) 1 : to chalk up usu. as a series 2 : to tell or recite  
usu. at length *reel off* a few jokes to break the ice)  
adj (1961) : of, relating to, or utilizing magnetic tape that  
reading on a take-up reel (a ~ tape recorder)  
ler \rē-əm'brōd'ər \ v (1927) : to outline a design (as on  
embroidery stitching  
wē-əm'plōi' vt (ca. 1611) : to employ again; esp : to hire  
em·ploy·ment \mōy'mēnt \ n  
wē-nak't \ vt (1676) 1 : to enact (as a law) again 2 : to act  
again 3 : to repeat

again 3 : to repeat the actions of (an earlier event or incident) *act* -ment *v-hak(t)-mant* n  
ré-én-fôr(s) *rs*, *fôr(s)rs* \ var of REINFORCE  
ré-ént-or *vi* (15c) 1 : to enter (something) again 2 : to enter ~ vi : to enter again  
(*l*)ré-én-tran(t)s *n* (1594) REENTRY  
-trans- *adj* (1781) : directed inward  
(1899) 1 : one that reenters 2 : one that is reentrant 3  
in a landform  
é-én-tfè *n* (15c) 1 : a retaking possession; esp : entry by  
eased premises on the tenant's failure to perform the conditions  
2 : a second or new entry 3 : a playing card that  
player to regain the lead 4 : the action of reentering the  
sphere after travel in space  
[prob. short for Sc *arrest* to arrest, fr. ME (Sc) *arreisten*,  
— more at ARREST] chiefly *Scot* (1786) : BALK  
*n* [ME *reve*, fr. OE *geréfa*, fr. *ge-* (associative prefix) +  
OE -rōf number, OHG *ruowa*] — more at co] (bef. 12c)  
administrative agent of an Anglo-Saxon king 2 : a medieval  
military officer responsible chiefly for overseeing the dis-  
obligations 3 a : the council president in some Ca-  
pitalities b : a local official charged with enforcement of  
laws (*decrees*)

**RÖV** or **reved**; **reev-ing** [origin unknown] **v** (1627) 1: a rope) through a hole or opening 2: to fasten by passing a hole or around something 3: to pass a rope through ~ to pass through a block or similar device alter. of *ruff* (1634): the female of the ruff (sandpiper) 99: a referee in a game or sport **re-fash-ion** **n** (1803) : REMAKE, ALTER

**REFECTORY** [REMARK AFTER  
A. v. [L. *refectus*, pp.] archaic (15c) : to refresh with food  
*rek-shən'* n [ME *refectioun*, fr. MF *refection*, fr. L *refec-*  
fr. *refectus*, pp. of *reficere* to restore, fr. *re-* + *facere* to  
e at DO] (14c) 1 : refreshment of mind, spirit, or body;  
MENT 2 a : the taking of refreshment b : food and  
REPAST  
*-fek' shən-ri'* n pl -ries [LL *refectorium*, fr. L *refectus*]  
ing hall (as in a monastery or college)

*n* (1923): a long table with heavy legs  
*r*-~~referred~~; *re-feling* [L *refellere* to prove false, refute, fr. *r*-~~deceive~~ — more at FAIL] *obs* (1530) : REJECT, REPULSE.  
*r*-~~refer~~; *re-referring* [ME *referren*, fr. L *referre* to bring  
fr. *re-* + *ferre* to carry — more at BEAR] *v* (14c) 1  
ink of, regard, or classify within a general category or  
o explain in terms of a general cause b : to allot to a  
ze, stage, or period c : to regard as coming from or  
specific area 2 a : to send or direct for treatment, aid,  
r decision (~ a patient to a specialist) (~ a bill back to a  
; to direct for testimony or guaranty as to character or  
1 a : to have relation or connection : RELATE b : to  
i usu by clear and specific mention (*no one referred to*  
arrel) 2 : to have recourse : glance *at* (notes while speaking) — *re-ferable* \r\ref-(s)-ra-bal,  
-*re-fer-er* \r\ref-(r)-er\ n  
*r*\r\ref-(n) (1621) 1 : one to whom a thing is referred; as  
when a man  
a

**-ee-ing** *v t* (1889) 1 : to conduct (as a match or game) a : to arbitrate (see *arbitration*) b : to administer 2 : a person who reviews an esp. technical publication c : REFERENCE 4a 2 : a sports official usually in administering a game 3 *chiefly Brit* : REFER-

**refer** <sup>1</sup> *v.* to arbitrate (as a legal matter) as a judge or third view (as a technical paper) before publication ~ *vi*; to ~*orn*(*t*s), *'ref-(ə-)ran(t)s*, *n* (1589) 1 : the act of referring 2 : a bearing-on-a-matter : RELATION (*in ~ to* your ~; something that refers: as a : ALLUSION, MENTION b a sign or indication) that refers a reader or consultor to information (as a book or passage) c : consultation formation 4 : one referred to or consulted: as a : a

person to whom inquiries as to character or ability can be made b : a statement of the qualifications of a person seeking employment or appointment given by someone familiar with the person c (1) : a source of information (as a book or passage) to which a reader or consulter is referred (2) : a work (as a dictionary or encyclopedia) containing useful facts or information d : DENOTATION, MEANING  
<sup>2</sup>reference adj (1856) : used or usable for reference; esp : constituting a standard for measuring or constructing  
<sup>3</sup>reference v. -enced, -encing (1801)

**reference v -enced; -encing** (1891) **1** **a** : to supply with references  
**b** : to cite in or as a reference **2** : to put in a form (as a table) adapted  
 to easy reference

**reference mark** (n 1856) : a conventional mark (as \*, †, or ‡) placed in  
 written or printed text to direct the reader's attention esp. to a footnote

**refer-en-dum** [ref-uh-ren-duhm] *n* **pl** -da (-dəs) or -dums [NL, fr. L, neut.  
 of *referendus*, gerundive of *referre*] (1847) **1** a : the principle  
 or practice of submitting to popular vote a measure passed on or pro-  
 posed by a legislative body or by popular initiative **b** : a vote on a  
 measure so submitted **2** : a diplomatic agent's note asking his govern-  
 ment for instructions

**refer-ent** \ref-(ə)-rənt\ *n* [L *referent-, referens*, prp. of *referre*] (1844) : one that refers or is referred to; *esp* : the thing that a symbol (as a word or sign) stands for — **referent adj**

**refer-ential** \ref-ə-reñ-chəl\ *adj* (1660) : of, containing, or constituting a reference — **refer-ential-ity** \-,ren-chē'-al-ətē\ *n* — **refer-ential-ly** \-,rench-(ə)-lē\ *adv*

**refer-ral** \ri-fär'äl\ *n* (1927) : 1: the act, action, or an instance of referring 2: one that is referred

**re-fill** \rē-fil\ *vt* (1681) : to fill again : REPLENISH ~ *vi* : to become filled again — **re-fill-able** \-ə-bəl\ *adj*

**re-fill** \rē-fil\ *n* (1886) 1: a product or a container and a product used to refill the exhausted supply of a device 2: something provided again; *esp*: a second filling of a medical prescription

**refi-nance** \rē-fē-nāns\, (\rē-fē-sē, \rē-(fē)-nāns\) *n* (1908) : to renew or reorganize the financing of ~ *vi*; to finance something anew  
**refi-ne** \rē-fin\ *vb* **refi ned**; **refi ning** *vt* (1582) 1: to reduce (as metal, sugar, or oil) to a pure state 2: to free from moral imperfection: ELEVATE 3: to improve or perfect by pruning or polishing (~ a poetic style) 4: to reduce in vigor or intensity 5: to free from what is coarse, vulgar, or uncouth ~ *vi* 1: to become pure or perfected 2: to make improvement by introducing subtleties or distinctions — **refi nement** \rē-fin'mēnt\ *n*

**e-fined** \ri-'find\ *adj* (1588) 1 : FASTIDIOUS, CULTIVATED 2 : free from impurities 3 : PRECISE, EXACT (*a ~ test for radioactivity*)  
**e-fine-ment** \ri-'fin-mənt\ *n* (ca. 1611) 1 : the action or process of refining

**refinement** (rē-fīn'ə-mənt) *n* (ca. 1611) 1 : the action or process of refining 2 : the quality or state of being refined : CULTIVATION 3 a : a refined feature or method *b* : a highly refined distinction : SUBTLETY 4 : a contrivance or device intended to improve or perfect

**refin-ery** *ri'-fin-(ə)rē* *n.* *pl.* **-er-ies** (1727) : a building and equipment for refining or processing esp. metals, oil, or sugar  
**refin-ish** *(rē)fīn'ish* *v.* (1931) : to give (as furniture) a new surface  
*vi* : to refinish furniture — **re-finisher** *n.*

**re-fit** ( $\text{r}^{\text{e}}\text{-f}\text{ɪt}$ ) vt (1666) : to fit out or supply again ~ vi : to obtain repairs or fresh supplies or equipment  
**re-fit** ( $\text{r}^{\text{e}}\text{-f}\text{ɪt}$ ,  $\text{r}^{\text{e}}\text{-f}\text{ɪt}$ ) (1799) : the action of refitting; esp. : a refitting and reequipping of a ship

**-fla-tion** \('re-'flā-shən\) *n* [re- + -flation (as in deflation)] (1932) restoration of deflated prices to a desirable level — **re-fla-tion-ary** \(-shə-nərē\)

**flect** (*flékt*) **vb** [ME reflecten, fr. L reflectere to bend back, fr. re- + flectere to bend] **v1** (15c) **1** archaic : to turn into or away from a course : DEFLECT **2** : to turn, throw, or bend off or backward at an angle (a mirror *reflects* light) **3** : to cause to bend or curve

**mirror** *n.* 1 : a polished plane surface that reflects light and at an angle (*a mirror ~s light*) 3 : to bend or fold back 4 : to give back or exhibit as an image, likeness, or outline : MIRROR (*the clouds were ~ed in the water*) 5 : to bring or cast as a result (*his attitude ~s little credit on his judgment*) 6 : to make manifest or apparent : SHOW (*the pulse ~s the condition of the heart*) 7 : REALIZE, CONSIDER ~vi 1 to throw back light or sound 2 *a* : to think quietly and calmly *b* to express a thought or opinion resulting from reflection 3 *a* : to tend to bring reproach or discredit (*an investigation that ~s on all the members of the department*) *b* : to bring about a specified appearance *c* : to characterize (an act which ~s well on him) *d* : to have a bearing or influence *syn* see THINK

**flec-tance** \flek'-tans\, *n.* (1926) : the fraction of the total radiant flux incident upon a surface that is reflected and that varies according to the wavelength distribution of the incident radiation — called also **flec-tiv-i-ty** \flek'-tiv-i-té, ri-\  
lecting telescope *n.* (1924) : REFLECTOR 2

**reflec·tion** *ri-flek'shon* **n** [ME, alter. of *reflexion*, fr. LL *reflexion*, *flexio* act of bending back, fr. L *reflexus*, pp. of *reflexer*] (14c) 1 an instance of reflecting; esp : the return of light or sound waves from a surface 2 : the production of an image by or as if by a mirror 3 a. the action of bending or folding back b : a reflected part: FOLD 4 something produced by reflecting; as a : an image given back by a reflecting surface b : an effect produced by an influence (a high crime rate is a ~ of an unstable society) 5 : an often obscure or indirect criticism : REPROACH *(the book was suppressed as a ~ on the regime)* 6 : a thought, idea, or opinion formed or a remark made as a result of meditation 7 : consideration of some subject matter, idea, or purpose 8 : turning back : RETURN 9 a : a transformation of a figure in which each point is replaced by a point symmetric with respect to a line or a transformation that involves reflection in more than one axis of a rectangular coordinate system — **reflec·tion·al** *shən'ēl* adj 10 : reflexive *ri-flek'tiv* adj (1627) 1 : capable of reflecting light, images, or sound waves 2 : marked by reflection : THOUGHTFUL, DELIBERATIVE 3 : of, relating to, or caused by reflection (*~ of the law*) 4 : REFLEXIVE (*~ verb*) — **reflec·tive·ly** adv — **reflec·tive·ness** *shən'ēs* n

about \ə\ kitten, F table \ər\ further \ā\ ash \ā\ ace \ā\ cot, can  
out \ch\ chin \e\ bet \ē\ easy \g\ go \i\ hit \l\ ice \j\ joy  
sing \ō\ go \ō\ law \ō\ boy \th\ thin \th\ the \l\ loo\ foot \u\ food  
yet \zh\ vision \ā\ k\ \æ\ ee, \æ\ ee, \æ\ ee *see Guide to Pronunciation*